EXPERIENCES WITH ESPC RENEWABLE ENERGY PROJECTS AT FT. HUACHUCA

A Review of Lessons Learned and Implications for Other DOD Facilities

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6 December 2000
Atlanta, GA

PRESENTATION OUTLINE

1. Background information
2. Brief review of Ft. Huachuca's renewable energy projects
3. Review of ESPC activities at Ft. Huachuca -- traditional and renewable energy
4. Lessons learned from Ft. Huachuca with respect to ESPC and renewable energy; plans for the future
5. Implications for other DOD facilities and organizations

BACKGROUND

- Ft. Huachuca is one of the oldest US DOD facilities
  - 123 years old
  - Located near US/Mexico border in Southeast Arizona
- Primary mission is U.S. Army Intelligence Training
- Excellent renewable energy resources--solar, wind, and geothermal
- Ft. commanders serious about reducing fossil energy use
  - 25 Energy projects in the last 7 Years
  - Electric load reduced 9.6% since 1996
  - 13 Awards received from the Federal level and Army since 1992 for energy conservation
  - Innovation is encouraged

FT. HUACHUCA

Ft. Huachuca, US Army

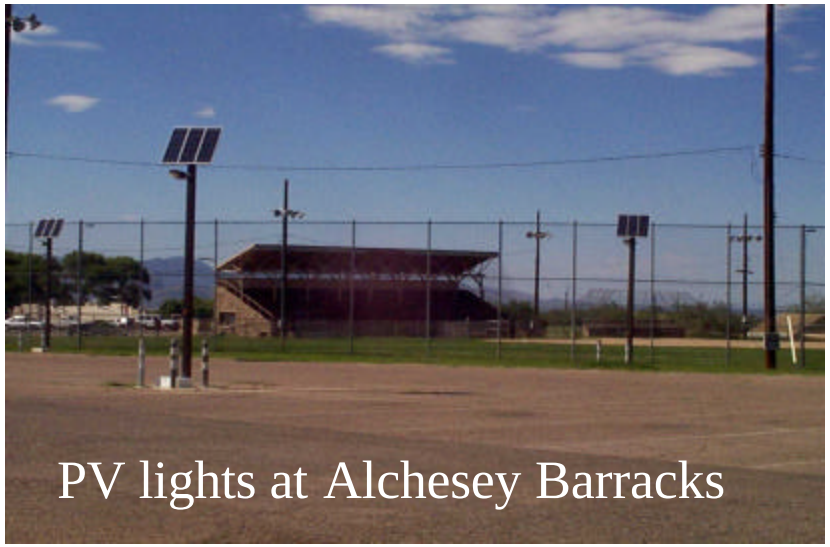
Sandia National Labs, USDOE

RENEWABLE PROJECTS AT FT. HUACHUCA


Barnes PV and DHW


Housing Solar Hot Water


Dish/Stirling


PV lights at Alchesey Barracks

Ft. Huachuca, US Army

Sandia National Labs, USDOE

ESPC ACTIVITIES AT FT. HUACHUCA

Conventional Projects

- ESPC activities began in 1995
- Task order contract awarded to HEC in 1996; processed through Huntsville Army Corps of Engineers
- 3 Task Orders issued, most have been focused on energy conservation
- Over $1.25 Million in Projects have been completed resulting in $250 Thousand in Annual Energy savings
- Traditional projects include: lighting retrofits and chiller replacements
- A new ESCO will be added to the team this year to allow more and a wider variety of projects to be completed

A COMPLETED CONVENTIONAL ESPC PROJECT AT FT. HUACHUCA

Lighting project at Kitchen at La Hacienda Club

Ft. Huachuca, US Army

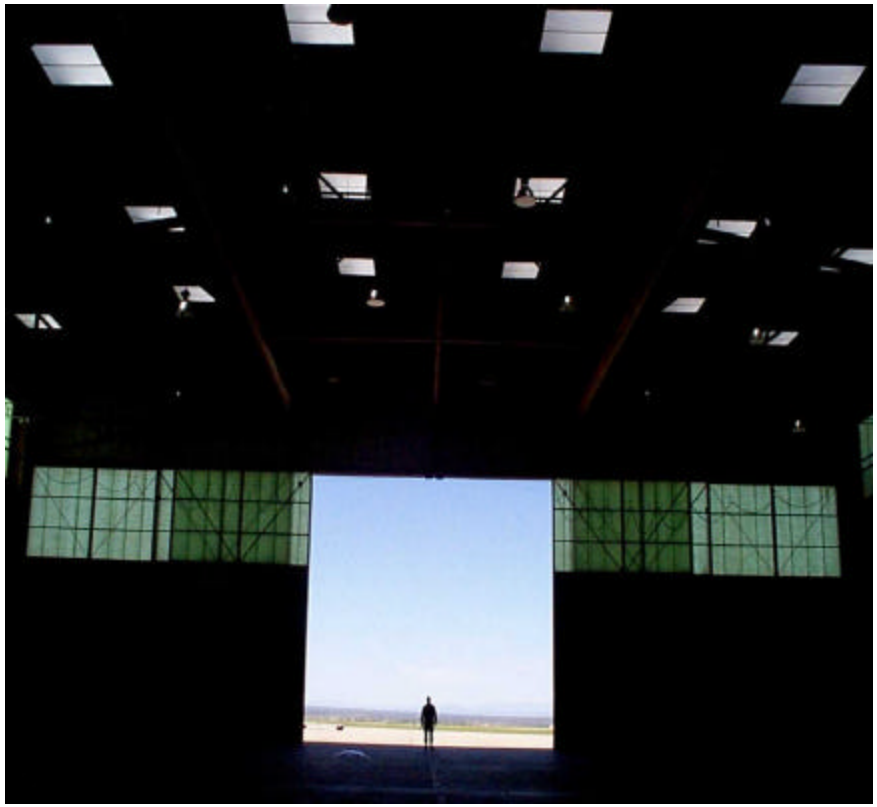
Sandia National Labs, USDOE

ESPC ACTIVITIES AT FT. HUACHUCA

Renewable Projects

- Recently renewable projects have been encouraged; goal is for 5%-10% of ESPC to be renewable in each task order
- DOE Super ESPC contractors are not primarily used because they are too technology specific; One solar hot water project for the post hospital was planned, but never built due to personnel shortages at the local hospital
- Two Task Orders issued that include daylighting
- Renewable projects usually are not economically attractive to stand by themselves; bundling with more cost effective projects is a possible solution.
- Energy production projects are a potential problem because ESPC focuses on energy conservation NOT energy production

SOME COMPLETED ESPC RENEWABLE PROJECTS AT FT. HUACHUCA



Daylighting in Hangar #1

Holman Guest House PV
(repaired PV System)

FT. HUACHUCA' PRINCIPLES FOR ENGAGING ESCOs IN RENEWABLE ENERGY PROJECTS

- ESCOs are very conservative because they assume all of the risk in a project. Therefore, they want to be sure they are going to make a profit on Post projects.
- Project (or bundled projects) must be cost effective. A list of potential projects should be assembled so that priorities can be established for bundling
- The technology to be applied must be well established or there should be much supporting documentation for them.
- ESCOs need encouragement from the base energy manager before they will implement a renewable energy project.
- Technical guidance must be available to help support the ESCO in dealing with renewable technology.
- Constantly add potential new renewable projects into the ESPC pipeline

FT. HUACHUCA APPLIES ALL OF THESE PRINCIPLES TO ITS ESPCs

- Suggested project-bundles are assembled and presented to the ESCO. Economic analysis is performed on each bundle prior to presentation. Alternative bundling possibilities are considered and prepared for presentation.
- Technologies that are selected match the ESCO's capabilities and are very cost effective, especially for the initial projects.
- Post energy manager strongly encourages renewable projects and is supported by Commanding General. Essentially, conventional projects are tied to renewable ones.
- Technical support is provided to the ESCO on the renewable projects through the energy manager, his staff, or supporting DOE national labs.
- Energy manager is currently working with Sandia on developing some new ideas for ESPC projects (e.g., solar attic hot water system).

LESSONS LEARNED FROM FT. HUACHUCA'S EXPERIENCE WITH ESCOs

1) Some renewable projects can be performed through ESCOs. Those technologies that are well established (e.g., daylighting) are easiest to do first.

2) Credible technical support must be available to the ESCO for any renewable technology project, DOE labs, such as Sandia, should be part of the team.

3) Project bundling is effective, but will only work with ESCOs who retain broad capabilities and can handle a variety of technologies including conventional ones, such as energy conservation.

4) Strong encouragement from the energy manager and CG is required to insure renewable projects happen.

5) Innovative approaches should be developed to find ways to use ESPCs for energy production projects, especially larger scale wind/electric systems.

6) New ideas for ESPC projects need constant development

HOW CAN THESE LESSONS BE APPLIED DOD WIDE?

- Establish policy support at highest levels; DOD support for TREC is important to establish credibility
- Develop a clear goal for using ESCOs to perform renewable energy projects and publicize the goal throughout DOD.
- Publicize the goal to the ESCO community through presentations at annual meetings (e.g., National Assoc. of Energy Service Cos.) and trade journals
- Establish a technology assistance and training team
  - Provide assistance to energy managers in selecting projects, and performing preliminary technical and economic analysis for bundling (partially completed by Sandia)
  - Provide training and technical assistance to ESCOs on a scheduled and ad hoc basis
  - Sandia is prepared to provide these services
- Start small with a few successes and use them to the encourage more projects